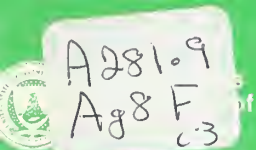


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Foreign Agricultural
Economic Report
Number 197

Brazil

An Export Market Profile

Samuel R. Ruff
Myles J. Mielke

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Abstract

Brazil, among the leading 20 importers of U.S. agricultural goods in the early eighties, will likely allow the United States less than a 50-percent share of its import market through the balance of the decade. Government policies and increased competition from Canada, the European Community, and some favored Latin American countries may hamper U.S. efforts to further penetrate Brazil's market. Favorable credit programs and an economic recovery are key to the United States regaining status as a leading supplier of wheat and other farm products.

Keywords: Brazil, economic growth, agricultural imports, agricultural production policies, agricultural trade policies, trade shares, import projections .

Acknowledgments

Many persons made valuable contributions to the preparation of this study. Reviews of earlier drafts were made by Joseph Butler, Dee Richmond, Leon Mears, and Ed Rossmiller, among others, of the Foreign Agricultural Service. Valuable comments and suggestions were made by analysts in the Economic Research Service, International Economics Division—Oswald Blaich, Charles Hanrahan, John Link, Gene Mathia, and Lisa Shapiro. Jim Carlin provided editorial assistance and review. Many thanks to Norma Giron, Delores Riley, and Linda Turner for their time and effort in typing and other manuscript preparations.

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Preface

Expanding the market for U.S. agricultural exports is a major goal of the U.S. Department of Agriculture. In support of this goal, the Economic Research Service in cooperation with the Foreign Agricultural Service is preparing export profiles for a number of high-potential markets for U.S. agricultural products. The Economic Research Service is USDA's major source of agricultural and trade information on foreign countries and regions, while the latter has the key role in helping U.S. agriculture further increase exports in world markets.

This report presents information on the prospects for U.S. agricultural exports to Brazil. The study surveys the basic factors underlying agricultural supply and demand, presents longrun projections of food and agricultural trade, and suggests opportunities for export expansion. The report is intended for use by officials responsible for export market development programs, the agribusiness community, and the general public. The profile will also help identify information gaps and can serve as a base for subsequent evaluations of the impacts of market extension activities. Similar profiles are being prepared for selected markets in: Africa and the Middle East, Asia, and Latin America.

Conversion Chart

This report uses metric units throughout.

1 metric ton = 2,204.62 pounds

1 hectare = 2.471 acres

179.39 cruzeiros = 1 U.S. dollar (1982)

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Summary

The U.S. share of Brazilian agricultural imports will probably remain under 50 percent through the remainder of the eighties. The U.S. share jumped to 45 percent (\$976 million) in 1981 from 30 percent (\$711 million) in 1980, making Brazil one of the top 20 importers of U.S. agricultural products in the early eighties. However, analysts doubt that the United States can maintain its recent large share of Brazil's farm imports because of stiff competition from other suppliers.

Brazil's soaring economic growth of the late sixties and early seventies was staggered by increased oil prices, a depressed world export market, and a heavy reliance on imports. A combination of highly subsidized credit programs, import controls, production subsidies, and low-cost food policies bolstered agricultural production but generated balance-of-payment problems when global demand for agricultural goods cooled. The Brazilian Government has responded to a growing debt and a stagnant economy by establishing an austerity program that will attempt to curb imports and reduce consumer and producer subsidies. Earlier policies designed to protect domestic production through high tariffs and port taxes will likely be continued.

The United States faces strong competition from Canada, the European Community (EC), and the Latin American Integration Association (LAIA). The LAIA gives preferred treatment to its members, which include most of the major Latin American countries. Wheat is Brazil's largest import, at 40 percent of the total, but the United States will have difficulty in exploiting its potential unless attractive credit terms can be offered.

Canada's advantage is high-quality wheat which blends well with Brazil's domestic wheat. Canada's guaranteed market in Brazil follows 2- and 3-year agreements underwritten by credit. The EC sends high-value products, such as malting barley, malt, dry milk, cream, wine, and fresh potatoes, some under subsidy.

Brazil's changeable weather and stumbling economy may afford export opportunities to alert U.S. shippers. Favorable credit programs and other market development activities have the potential for improving exports to Brazil. Reductions in import barriers and a stepped-up campaign on the quality and availability of U.S. goods aimed at Brazilian consumers could brighten the export picture.

BRAZIL



Brazil: An Export Market Profile

Samuel R. Ruff
Myles J. Mielke

Introduction

Expanding export markets for farm products is a primary goal for U.S. agriculture today. To develop effective export strategies and programs, one must determine if a market has expansion possibilities and which products will be sold to that market. The U.S. Department of Agriculture (USDA) and exporters also must explore constraints to take advantage of the opportunities that exist. Such information is essential for deciding the type of export credit, the level of market promotions and information programs, the domestic and import policy changes that might be negotiated, U.S. export pricing policies, and appropriate economic development assistance.

This report develops such information for Brazil in the eighties; examines the potential for economic growth as the underpinning for the future demand for farm products; projects the production and consumption of major and some minor farm products to determine import needs; and looks at the subsidies, taxes, tariffs, and other policy implements that may make it difficult or impossible for the United States to improve its market position.

The Economy

Total gross domestic product (GDP) in 1980 was nearly \$250 billion, producing a per capita income of \$2,038. The 1980 population was estimated at nearly 122 million and, although increasing in absolute terms, reflected a declining annual growth rate. Urban growth paralleled economic growth. In 1980 the urban population had reached 82.4 million, 68 percent of the total; rural residents had numbered 39.6 million.

Brazil's remarkable economic growth began in 1967 and continued until 1980 (table 1). During the early period of the "Brazilian miracle" annual growth rates averaged 8 percent or more. Brazil became a textbook example of how less developed countries might orchestrate their policies and mold financial institutions, industry, and agricultural resources to achieve growth. Sharply increasing exports and large volumes of imported capital were the twin engines driving the achievement. Although oil prices increased sharply in 1973, economic growth continued at a level of 6 to 8 percent until 1980 when high interest rates and sagging world markets brought on a recession.

Petroleum imports, which supplied 80 percent of total requirements, increased sharply after 1973. This and other increased imports drove Brazil to increase its dependence on international loans. By the end of 1982, total debt had reached \$85 billion. Servicing this debt and paying the petroleum import bill of \$9 billion used up most of Brazil's 1981 export earnings of \$23 billion leaving little to pay for other imports essential for production (table 2). A major effort began in 1982 to reduce dependence on international capital markets by raising exports further and reducing less essential imports. The austerity program will likely slow economic growth at least through 1985. Major imports will continue to be petroleum, cereal grains, and capital goods for development, including equipment for gasohol and hydroelectric power.

A synopsis of Brazil's economic development is helpful to understand Brazil as a major import market. It introduced changes in policy that are basic to current trends in the economy and in agricultural development.

Table 1—Income and population, selected years, 1970-82, estimated 1983-90

Year	Population	Growth rate from previous calendar year	Real GDP in 1970 prices	Growth rate from previous calendar year
	<i>Thousands</i>	<i>Percent</i>	<i>Million cruzeiros</i>	<i>Percent</i>
1970	95,684	2.76	210,118	8.8
1975	108,474	2.44	344,826	5.6
1979	119,175	2.35	455,863	6.7
1980	121,962	2.30	480,963	7.9
1981	124,815	2.25	471,825	-1.9
1982	127,561	2.20	471,825	0
1983	130,316	2.16	481,262	2.0
1985	135,887	2.10	515,527	4.0
1990	150,325	2.00	657,958	5.0

Sources: (24, 26) and authors' estimates.

Table 2—Balance of trade, 1970-81

Year	Exports		Total imports	Trade balance
	Total	Agricultural		
Million dollars				
1970	2,739	—	2,507	232
1971	2,904	—	4,183	−1,279
1972	3,991	2,200	4,232	−241
1973	6,199	4,300	6,192	7
1974	7,951	5,000	12,641	−4,690
1975	8,670	4,900	12,210	−3,540
1976	10,128	6,200	12,383	−2,255
1977	12,120	7,700	12,023	97
1978	12,659	6,800	13,683	−1,024
1979	15,244	7,300	18,084	−2,840
1980	20,132	9,400	22,961	−2,829
1981	23,300	9,600	22,100	1,200

— = not available.

Source: (4).

Agriculture was modernized through one of the most aggressive agricultural credit programs in the world. In the late sixties, Brazil set up four financial institutions that provided the capital necessary for development. These banks redirected pension funds, private savings,

and loans from international sources to development projects and improved technology. The four major banks were the National Housing Bank, the National Economic Development Bank, the Bank of Brazil, and the Bank of the Northeast. The United States joined other countries in investing more than \$6 billion.

Government credit made possible a strong surge in industrial development which included agricultural crushing and milling facilities. Iron and steel developments underlay a thriving automobile and machine industry. Fertilizer and chemical production supplied the agricultural sector, and several other industries provided durable consumer goods, computers, and aircraft. A huge hydroelectric program powered these industries from several sites in southern Brazil.

Brazil also developed infrastructure to improve domestic marketing and exports. An export corridors program enhanced agricultural shipping and storage capacity at the ports. Highways and feeder roads spread throughout the country, especially in the South where much of the agricultural development took place. By 1981 farm product exports reached \$9.6 billion, over 40 percent of total exports.

Brazil as a Food Import Market

Brazil today produces most of its own food and has substantial quantities available for export. Despite numerous attempts to increase wheat production, Brazil continues to import more than it grows. Other significant food import categories include fresh fruit (apples and pears), vegetables, malting barley, and hops. These imports mostly supply a growing industrial economy rather than fulfill basic food needs. A substantial quantity of imports support agricultural production including hatching eggs, live beef and dairy cattle, and seeds for planting. Inedible tallow is imported for the soap and cosmetic industries.

Agricultural imports reached a record \$2.5 billion in 1980, more than eight times the level of 1970 (table 3). Although agricultural imports grew substantially, the costs of fuel imports surged. Other imports grew ninefold. Meanwhile the value of U.S. exports to Brazil grew tenfold, but its share remained within a range of 20 to 30 percent during most of the period. In 1981, when the worldwide depression set in and Brazil needed

Table 3—Total imports, agricultural imports, and the U.S. share, selected years, 1970-81

Year	Total imports	Agricultural imports		
		Total	United States	U.S. share ¹
		-----Billions dollars-----		Percent
1970	2.5	0.3	0.7	23
1975	12.2	.9	.3	40
1980	23.0	2.5	.7	30
1981	22.1	2.2	1.0	45

¹As calculated from unrounded data.

Source: (11).

credit to finance its import program and debt service, the U.S. share again increased to hit a 10-year high of 45 percent, equivalent to just under \$1 billion in trade.

The Agricultural Sector

Brazil has two distinct, contrasting agricultures, one in the South that is modern and one in the Northeast that is traditional. The highly productive South is an area of temperate rainfall and the best soils, producing the bulk of the food and export crops except cocoa, manioc, and upland rice. The Northeast is noteworthy for its lack of rainfall, poor soils, limited infrastructure, and little potential. The leading edge of Brazil's vast frontier has reached the temperate rainfall zones of Mato Grosso do Sul and the savannah brushland of the Campo Cerrado. The *cerrado* is a vast land reserve of some 180 million hectares, of which 50 million appear to be suitable for agriculture. The area is located between 10 and 20 degrees latitude and expands from Brazil's western borders with Bolivia and Paraguay toward the northeast (see map).

More specifically five areas of agricultural production are generally recognized on the basis of climate and soil. They are as follows:

Southeast—(State of Sao Paulo, Minas Gerais, Espirito Santo, and Rio de Janeiro.) This area has a subtropical and temperate zone climate. Centered on the city of Sao Paulo, it includes large areas for export crops such as sugarcane, coffee, oranges, and cotton as well as food crops such as rice,

corn, beans, and potatoes. Brazil's milkshed and its major poultry and cattle slaughter areas are in this region. Its infrastructure includes the best in the country. Sugar production in the Southeast has outstripped the traditional producing areas of the Northeast since World War II. A billion-dollar coffee replanting program following the Parana coffee freeze in 1975 tried with only limited success to shift the bulk of coffee production northward to this region which is closer to the equator.

South—(States of Parana, Santa Catarina, and Rio Grande do Sul.) These southernmost states have a temperate climate and constitute the other large producing area. The region is mostly planted in rice, corn, and wheat. Rio Grande do Sul has irrigated rice areas with high yields. Parana and Rio Grande do Sul are the major soybean and wheat states. Large areas of Brazil's finest soils are located in western Parana, which produces coffee, peanuts, corn, cotton, soybeans, and wheat. Rio Grande do Sul shares beef production with Sao Paulo and Santa Catarina, the center for poultry exports. Two of Brazil's export corridors are located in the region providing a channel for soybeans, soybean meal, processed beef, and broilers.

Northeast—(All states from Bahia north through Maranhao.) This is the dry area of Brazil. Yet 30 percent of Brazil's population lives here. Agriculture is largely subsistence farming. A narrow rain-fed coastal section, however, produces one-third of Brazil's sugar and practically all the cocoa.

North—(States of Acre, Amazonas, Para, and the territories of Amapa and Roraima.) Largely humid tropics, it is the largest and the least productive area of the Brazilian regions. Rice, manioc, pepper, and Brazil nuts are produced in isolated areas.

Central-West—(States of Goias, Mato Grosso, Mato Grosso do Sul, and Rondonia.) These states contain the rapidly opening frontier of the *cerrado*. Most of the area is the savannah land often referred to as the largest soil bank in the world. Soils are hyperacidic and lack phosphate but produce well when appropriate fertilizer is applied, having potential for wheat, rice, soybeans, corn, cattle, and other commodities.

The Structure of Agriculture

Preliminary results of the 1980 Brazilian Census of Agriculture showed that farmland included:

- Total area—371.9 million hectares
- Crop area—51.4 million hectares (13.8 percent)
- Livestock pasture—171.9 million hectares (46.1 percent)
- Forestry operation—83.8 million hectares (22.5 percent)
- Unused—65.3 million hectares (17.6 percent)

Cropland harvested increased greatly between 1970 and 1980. The principal crops, which constituted about 90 percent of total cropland, increased by 50 percent from 31 million hectares to nearly 45 million (table 4). Virtually every major crop reflected strong growth, especially soybeans and oranges, the two major crops competing against U.S. farmers.

Most of Brazil's agricultural production takes place on medium- to large-size farms (more than 10 hectares). However, small farms (less than 10 hectares) equaled other farms in number but occupied only 2.8 percent of the total land in farms (table 5).

Despite substantial progress in mechanization, the number of farmworkers in Brazil increased from 17.6 million in 1970 to more than 21 million in 1980. By 1980 there were 598,000 tractors in use, one for every nine rural establishments. Most of the tractors were in Sao Paulo, Parana, and Rio Grande do Sul states.

Fertilizer use in 1980 reached more than 4 million tons on a nutrient basis, some 3 million tons more than 10 years earlier. The 1980 figure included: nitrogen, 900,000 tons; phosphate, 2 million tons; and potash, 1.3 million tons. Three cash crops, soybeans, sugar-cane, and coffee, received much of the fertilizer.

Research and extension have undoubtedly helped to stimulate agricultural production. Much of the research is conducted by a public sector corporation, EMBRAPA, which is attached to the Ministry of Agriculture and has three regional centers, 11 subcenters for commodity research, and 18 state-level research stations. Staffed by 6,739, its 1980 budget was about \$150

Table 4—Area planted to principal crops, 1970 and 1980

Crop	1970		1980	
	Area	Proportion of total	Area	Proportion of total
	<i>1,000 hectares</i>	<i>Percent</i>	<i>1,000 hectares</i>	<i>Percent</i>
Corn	9,858	29.0	11,621	22.6
Soybeans	1,319	3.9	8,762	17.1
Rice	4,979	14.7	6,204	12.1
Dry beans	3,485	10.3	4,785	9.3
Wheat	1,895	5.6	3,062	6.0
Coffee	2,403	7.1	2,020	5.9
Manioc	2,025	6.0	2,000	3.9
Cotton	2,469	7.3	1,980	3.9
Sugarcane ¹	1,725	5.1	1,730	3.4
Cocoa	444	1.3	640	1.2
Oranges	202	.6	575	1.1
Castor beans	381	1.1	440	.9
Other	2,785	8.2	6,521	12.7
Total	33,970	100.0	51,350	100.0

¹For human consumption only.

Source: (16).

Table 5—Distribution of agricultural land, by farm size, 1975

Hectares	Number of farms	Total area in farms
	<i>Thousands</i>	<i>1,000 hectares</i>
Less than 10	2,602	8,983
10 to 99	1,899	60,172
100 to 999	466	115,923
1,000 to 9,999	40	89,867
10,000 and more	2	48,952
Total	5,165	323,897

Source: (5).

million. The World Bank and the Inter-American Development Bank have loaned EMBRAPA a combined \$106.4 million. The agricultural extension service, EMBRATER, has 5,000 specialists working with farmers and industry to improve and expand farm production.

The agricultural marketing system is comprised of truck owners, small merchants, producer cooperatives, and national and multinational corporations. In the

commercial agricultural areas of the Center-South, large Brazilian and multinational firms assemble, process, and export commodities, such as soybeans, coffee, orange juice, broilers, cotton, and corn. Cooperatives also play a key role especially in the marketing of soybeans and wheat in Parana and in Rio Grande do Sul.

The most primitive element of the marketing system is that which prevails for vegetables, fruits, and the indigenous food crops. COBAL, the food agency, has been organizing fresh produce marketing for nearly a decade and has set up large central markets at all major cities.

The infrastructure to handle imports is no longer the problem it once was. During the seventies, Government programs modernized the ports, mechanized loading and unloading, deepened harbors, increased storage and refrigerated capacity, and built roads and marketing systems to carry products to most of the populated areas. In the northeast and at the frontier, Brazil still has a long way to go. Transport by diesel truck is the principal means of delivery, but this has become more expensive with the rise in energy prices. Recently implemented plans for road and railroad construction should provide some much needed improvement.

Agricultural Policy

Although Brazil has used most of the conventional policy tools to spur production, the primary approach has been to provide credit for purchasing farm inputs at subsidized interest rates. In 1982, for example, when inflation was about 100 percent for the year, farmers paid a 45-percent interest rate compared with commercial rates of 125 to 140 percent. Estimates show that the \$16 billion of rural credit was roughly equal to the value of agricultural production for that year; about a third was considered a direct subsidy.

Credit was made available for farm investments as well as for farm operations and marketing costs. Eighty percent went to financing the production and marketing of six crops—soybeans, wheat, rice, corn, coffee, and sugarcane. Banks are required to keep 10 percent of their portfolios in agricultural loans.

The amount of credit allowed to each producer for each allowable crop was based on a two-step calculation: the first step determined the cost of production,

and the second graduated the amount of credit according to the size of the farm operation. Large-scale producers obtained 50 percent of their cost at the subsidized rates, medium-scale producers 70 percent, and small-scale producers 100 percent.

Farm prices for 42 crops were supported through a minimum-price nonrecourse loan program to stimulate production and to encourage farmers to store excess quantities at harvest for release later in the year. Because a major objective revolved around helping farmers make appropriate planting decisions, the minimum prices were announced before planting time.

The price support program is administered by the Commission of Production Financing (CFP), an agency of the Ministry of Agriculture. Farmers have the option of selling their products on the market at the going price, selling to CFP at the guaranteed price, or borrowing the equivalent value at subsidized rates on a nonrecourse basis. In 1980 the budget for this operation was 220 billion cruzeiros (\$4.6 billion).

There is no support price on livestock products. However, an unofficial agreement among the Government, meat packers, and producer groups set the level at which beef may be sold in wholesale markets.

Production Trends

Wheat, corn, rice, soybeans, and poultry dominate Brazil's agriculture. Wheat's long record of imports is traced to domestic production failing to meet growing demand. Corn, Brazil's primary livestock feed, has been imported in large quantities to meet weather-induced production shortfalls. Rice is the most important staple, and small quantities are imported periodically. Soybeans and poultry are both exported in large quantities and compete with U.S. exports in world markets.

These five commodities are joined by a vast array of tropical and semitropical crops: export crops grown on more than 500,000 hectares each include coffee, sugar, cocoa, oranges, cotton, and tobacco; domestic crops grown on 500,000 hectares include beans, cassava, potatoes, and bananas. Brazil also produces large quantities of beef and pork.

Wheat generally occupies about 3 million hectares with wide annual fluctuations around this average. Production shortfalls are persistent despite huge investments and high price supports, because of the handicap of a warm and wet climate which promotes disease. Thus expansion plans have met with limited success. During most of the seventies, production increased 3.3 percent per year, all from area expansion. In the late seventies, an average of 3.3 million hectares were planted to wheat, annually, compared with 2.6 million hectares during the early part of the eighties. No overall increase in yields occurred for the period, although they fluctuated widely with the weather (table 6).

Wheat grown in southern Brazil faces so many natural risks that farmers are reluctant to plant it even when the Government's purchase price is well above the world price. The warm, rainy weather in Rio Grande do Sul, the principal producing state, spurs disease, especially scab and stem rust. Soil handicaps include hyperacidity and aluminum toxicity. Many a promising crop in midseason has been ruined between then and harvest by bad weather.

Since 1968 the Government has attempted to stimulate production with a series of very attractive support prices (table 7). In spite of goals set at 4.5 million tons, output exceeded 3 million tons only once.

The wheat campaign met its goal to supply 50 percent of domestic consumption needs only in the early seventies. Between 1965 and 1973, production increased tenfold from 200,000 tons to 2 million tons, a success attributed to the Government's price support program, which netted growers a 30-percent profit after input costs in years of moderately good harvests. Additional incentives were provided through subsidized credit, subsidized fertilizer, and research. During the early eighties, 60 to 70 percent of domestic requirements came from imports.

Wheat production increases still highlight Brazil's latest agricultural development plans. The new plan would produce wheat in the drier areas of the *cerrado* where it would be less vulnerable to diseases. Excess waters of the rainy season would be held in reservoirs to irrigate during the dry season. The Government has approved a \$900-million program for the *cerrado* and expects to complete coverage of an area of 1 million

Table 6—Wheat production, 1973-82

Marketing year	Area	Yield	Production
	<i>1,000 hectares</i>	<i>Tons/hectare</i>	<i>1,000 tons</i>
1973	1,839	1.104	2,031
1974	2,471	1.157	2,858
1975	2,931	.610	1,788
1976	3,539	.909	3,215
1977	3,153	.655	2,066
1978	2,811	.957	2,691
1979	3,830	.764	2,879
1980	3,062	.874	2,676
1981	1,921	1.150	2,217
1982	2,828	.654	1,849

Source: (14).

Table 7—Wheat support and import prices, selected years, 1970-82

Year	Support price	Import price
	<i>Dollars/ton</i>	
1970	106.06	64.09
1975	191.40	185.49
1979	207.89	149.00
1980	227.09	187.00
1981	313.36	210.00
1982	275.00	200.00

Sources: (8, 16, 19).

hectares by 1986. A loan of \$150 million has been arranged for the first stage.

Wheat expansion is also part of the PROVARZEAS program, irrigation and drainage of bottomlands, which was originally developed for rice production. It is a completely new concept for wheat production in Brazil. The potential is thought to be great, but production will likely be minimal before 1985. Associated structural and institutional developments are still on the drawing board.

Corn is Brazil's most extensively cultivated crop, occupying a record 13.2 million hectares in 1982. Acreage increased significantly over the last 3 years (1980-82) by an average of over 5 percent per year. Production shortfalls in 1978 and 1979 and increased feed demand for poultry and swine were so great that Brazil had to supplement domestic supplies with imports during 1978-80. However, the high prices that accompanied the shortfall and a supportive Government policy raised production in 1981 and 1982 to a self-sufficiency which eliminated imports.

The trend toward replacing primitive planting and harvesting procedures with modern methods of mechanization, fertilization, and pesticide application was especially prominent in the commercial producing areas of the Center-South which accounted for 95 percent of total corn production in 1981. National yields of 1,383 kg/ha in the late sixties hit a record 1,773 kg/ha in 1981. Increased yields, mostly from hybrid seed, reached 4,000 kg/ha in Sao Paulo and Parana, raising the average of states where corn was a subsistence crop.

Annual production increased 3.3 percent during 1973-80 despite severe droughts in 1978 and 1979. The strong incentive of high prices generated by the poultry boom accounted for a jump to 20.2 million tons in 1980 and to over 22 million tons for both 1981 and 1982.

The announcement of a minimum price before planting time is the basis for farmers' decisions for planting and determining the need for credit. The recently redesignated minimum price is geared to world market prices so as to correct for inflation. The principal subsidy, however, was still obtained through credit.

Rice, the third most important crop in area after corn and soybeans, occupied an average 6 million hectares (1979-81). Beginning in 1975, the first year when rice exceeded 5 million hectares, the planted area has been steadily increasing. Annual growth in production posted 4.3 percent during 1973-80 compared with an average decline of 1.4 percent during 1966-72. A record 9.8 million tons of paddy rice were produced in 1980.

Brazilian rice yields, relying largely on rainfed cultivation, average 1,400 kg/ha, low compared with 5,000 kg/ha in the United States or 4,300 kg/ha in Colombia.

Two distinct types of production give widely differing yields. The irrigated rice in Rio Grande do Sul and Santa Catarina yields close to 3,700 kg/ha, but the rainfed upland rice areas that extend to the frontier produce just over 1,000 kg/ha. Only 12 percent of the total area is irrigated.

The hefty increases in area during the last decade resulted from the settlement of new frontier land in Minas Gerais, Goias, and Mato Grosso, part of the *cerrado* region. Brazil, during the years of rapid economic growth, provided generous funding to encourage frontier settlement. The first crop planted by pioneers was usually upland rice, often sown between the stumps of newly cut trees. Yields were low, but the cost of producing upland rice per hectare in the *cerrado* was low, at only about \$80 per metric ton compared with \$210 per metric ton for irrigated rice in Rio Grande do Sul.

In reaction to shortages in 1963, the Government called for an adequate rice supply at all times. The program that emerged required a minimum stock of 500,000 tons and prompt measures to rebuild stocks after a drawdown. In 1979 Brazil imported 711,000 tons following 2 years of drought.

The principal institution governing trade in rice is the Rice Institute of Rio Grande do Sul, which manages a price support program and implements two development programs: rice production in the *cerrado*, and the PROVARZEAS program to develop bottomlands in the Central-Western states for irrigated rice production. Projects in Para, northern Goias, and Minas Gerais states are also underway.

Expenditures for rice development in the *cerrado* cost \$1 billion in the midseventies and saw 2.4 million hectares cleared, including 970,000 hectares for crops. Current austerity policy now limits rice development funding. The PROVARZEAS program had an optimistic goal to bring under cultivation some 500,000 hectares of rice by 1983. Sources now suggest that 1985 is a more likely date.

Soybeans have been the most spectacular growth crop of the seventies. Area planted soared from 900,000 hectares in 1969 to 8.8 million hectares in 1980. Production grew exponentially, increasing more than a million tons a year except during the droughts of 1978

and 1979. The production spiral began with 654,000 tons in 1968 and reached 15.2 million tons in 1981 becoming Brazil's leading export valued at \$3 billion. Soybeans constitute one-third of all agricultural exports, surpassing coffee, as the principal export crop.

The rise in production combined a sharp increase in area and yields. Yields increased steadily during the seventies from 1,144 kg/ha in 1970 to 1,770 kg/ha by 1977. Some of the growth in yields was traced to the expansion of soybeans into the highly fertile soils of Parana, following the severe coffee freeze of 1975 which prompted farmers to replace coffee with soybeans.

The Government's price support announcements and generous agricultural credit underwrote Brazil's remarkable soybean expansion in the seventies, but other factors were also important. The Government's support for wheat growers helped soybeans more than wheat. Capital expenditures on fertilizer, tractors, and combines for wheat fostered the possibility of a second crop of soybeans. The U.S. soybean embargo in 1973 also stimulated Brazil's soybean production, and soaring prices in 1973 and 1974 hastened the shift. Much of the Government aid to coffee growers was diverted to soybeans after the 1975 freeze.

An integral factor contributing to growth in the industry was the development of crushing facilities and associated marketing infrastructure. The Government financed the industry as well as the farmers at negative interest rates. Crushing capacity increased from 1 million tons in 1970 to 20 million tons by 1981, thus stimulating exports of soy products.

An export corridors program provided funding for the infrastructure and facilities, including vertical silos, conveyors, and high-speed loaders, at the ports of Paranagua and Rio Grande. To cut soybean transport costs, the Government is building a railway located in the major soybean-growing region to the port of Paranagua. In the western states, the highway program has allowed diesel trucks to transport beans from there to the ports. The World Bank recently provided Brazil with a loan of \$240 million to pave a highway from Cuiaba in Mato Grosso to the northwestern edge of Rondonia, thus opening new lands to soybean production. The total cost will be \$604 million.

Poultry production grew rapidly in the seventies. Bird numbers doubled during the decade to nearly 45 million layers by 1981, making the country virtually self-sufficient in eggs. The production of poultry meat also grew rapidly to surpass pork.

The production of poultry meat soared sixfold through the seventies from 245,000 tons in 1970 to 1.5 million tons in 1981. The states of Sao Paulo and Santa Catarina were the major centers of development. Investment in incubators and the importation of hatching eggs and day-old chicks during the decade fostered this development. The United States supplied over half of the baby chicks out of a total of 450,016 in 1978.

Government programs promoted poultry production by keeping the price of feed low and providing subsidized credit for export production. When soybean prices climbed in 1973 and 1974, the Government put a ceiling of \$140 per ton on soybean meal used for poultry production. Priority was given to domestic poultry producers; exporters received a quota for sales in the domestic market as a precondition to obtain export licenses. In some years, exporters had to sell 1 ton of beans domestically for every 3 tons exported and 1 ton of meal for every 5 exported.

Production in the Eighties

Less generous Government policies will likely keep production growth for the remainder of the eighties below that of the rapid-growth years. And, at least in the early part of the period, world demand for farm products may not resume its strength much beyond that associated with growing population. Farm returns will be limited by higher costs (reduced subsidies) and moderate increases in yields due to expansion into new lands. Because of higher costs, more land may be substituted for technological inputs, also resulting in fewer gains in yields.

Current austerity measures in accordance with commitments to the International Monetary Fund will reduce subsidies on farm inputs and delay progress. The Government has already raised the interest rates and tightened the availability of credit to farmers and agribusiness. Support prices on many commodities are being reduced to approach world levels.

Several factors will ameliorate this pessimistic outlook in the next year or so. In the short run, Brazil already has several contracts for exports of soybeans, soybean meal, and poultry to provide some assured market outlets through 1984. And the February 1983 devaluation of the cruzeiro by 30 percent will help, at least in the short run, to keep Brazil competitive in world markets.

Production in the eighties will also benefit from the momentum already achieved in developing the agricultural frontier. Some of the infrastructure is already in place and some previously funded projects such as the rice irrigation program in the *cerrado*, the integrated development of the Northwest, and the Carajas transportation program in Para and Maranhao will tend to bolster production in 5 to 10 years even without further investments.

In the longer run, Brazil has an abundance of land now in farms and has designated new land in the *cerrado* and elsewhere which is more than adequate to meet future domestic needs. The new lands tend to be less productive than the areas opened up in Parana and Sao Paulo during the seventies, but farmland can be increased. The conversion of some of the 165 million hectares of pasture to cropland offers another prospect for additional land. Projections of land use by 1990 of the four major crops show an average increase of one-third over the 1979/81 base period (table 8).

The developmental pattern of the seventies is not likely to be repeated. At that time, the high price of soybeans not only encouraged new land developments but also drew substantial land out of corn, pasture, and cotton. Better corn prospects in the eighties have already started some shifts to corn, and some of the new developments are likely to favor initially rice and possibly wheat.

Wheat production is projected to increase gradually between 1982 and 1990 because of expected favorable returns and the possibility of initial production on new lands. The Government, seeing that inflation eroded support prices, adopted a new type of support to offset inflation. Beginning in 1982, the cruzeiro price was pegged to a dollar equivalent so that the price incentive will suffer less inflationary erosion. The continued prospects of double-cropping with soybeans is also encouraging for further wheat expansion.

By 1990 total wheat production under normal yield conditions should be 40 percent more than what it was during the 1979/81 projection base period (table 9). However, yields will continue to vary widely so that production could range from 2.4 million to 4.2 million tons in individual years.

Corn production will spread into two large areas as settlement progresses and infrastructure improves. Farmers are already moving into Mato Grosso do Sul, where temperate zone rainfall is similar to previously developed states. The other area is the vast *cerrado* of the Central-West. Both areas are handicapped by the distance from domestic and export markets and await development of appropriate infrastructure. Pilot projects are already proceeding in Minas Gerais and other places. By 1990 much of this area should be occupied.

Table 8—Area devoted to major crops, 1979-81 average and 1980 projection

Crop	1979/81 average	1990 projection	Total change
	----1,000 hectares----		Percent
Wheat	2,938	3,700	25.9
Corn	11,885	15,700	32.1
Rice	6,044	7,511	24.3
Soybeans	8,517	12,187	43.1
Total	29,384	39,098	33.1

Table 9—Wheat production, base period and projections, selected years, 1979-90

Production year	Area harvested	Yield	Production
	1,000 hectares	Tons/hectare	1,000 tons
1979	3,830	0.75	2,879
1980	3,062	.87	2,676
1981	1,921	1.15	2,217
1983	2,808	.98	2,751
1985	3,037	.98	2,976
1990	3,700	.98	3,620

The demands for livestock feeding, especially poultry, will provide much of the motivation for increases in corn production. Expanding poultry exports are projected to continue through 1990, based on the attraction of Persian Gulf markets, and despite current world financial difficulties.

The annual increases in corn area could be as high as 2.5 percent, but the yields from frontier lands will be less than in the productive South and Southeast states. Even so, production is expected to increase to over 28 million tons by 1990, some 40 percent above the 1979-81 average level, and more than enough to meet domestic needs (table 10).

The potential for increased rice production will probably be sufficient to meet domestic demand. Large areas are being developed for rice production in Mato Grosso do Sul. The arid zone areas of the cerrado may be added if appropriate water control can be established. In the distant future, parts of the Pantanal, a flooded area neighboring Paraguay and Bolivia, could also support rice production. The EMBRAPA Center for Rice and Bean Research estimates that yields in the irrigated areas of Rio Grande do Sul could be increased from the current level of 3,700 kg/ha to as much as 4,500 kg/ha.

Analysts estimate that an average annual increase of 2.6 percent of rice production could be sustained until 1990 through increased demand spurred by growth in population and income and consumer shifts from manioc and other starchy foods to rice, the preferred cereal next to wheat.

A slight increase in yields to 1,450 kg/ha is expected in 1985 on the assumption that the rice irrigation program will have some effect. The 1990 projection of 11.3 million tons of paddy rice should be sufficient to meet domestic needs (table 11).

Soybean production in the eighties is projected to increase at a rate of 3 to 5 percent per year based on the assumption that Government policies will tend to favor this crop as long as its export potential persists (table 12).

The expected increases in soybean yields will not match those of the seventies. No significant breakthroughs in technology are anticipated, and future area expansion will be on less productive soils. Two factors,

Table 10—Corn production, base period and projections, selected years, 1979-90

Year	Area harvested	Yield	Production
	<i>1,000 hectares</i>	<i>Tons/hectare</i>	<i>1,000 tons</i>
1979	11,317	1.44	16,327
1980	11,621	1.74	20,214
1981	12,718	1.77	22,555
1983	12,304	1.74	21,410
1985	14,000	1.75	24,500
1990	15,700	1.80	28,260

Table 11—Paddy rice production, base period and projections, selected years, 1979-90

Year	Area harvested	Yield	Production
	<i>1,000 hectares</i>	<i>Tons/hectare</i>	<i>1,000 tons</i>
1979	5,452	1.4	7,595
1980	6,204	1.6	9,775
1981	6,477	1.3	8,638
1983	6,387	1.4	9,133
1985	6,689	1.4	9,699
1990	7,511	1.5	11,266

Table 12—Soybean production, base period and projections, selected years, 1979-90

Year	Area harvested	Yield	Production
	<i>1,000 hectares</i>	<i>Tons/hectare</i>	<i>1,000 tons</i>
1979	8,255	1.24	10,240
1980	8,762	1.73	15,152
1981	8,534	1.78	15,200
1983	9,262	1.58	14,634
1985	10,018	1.58	15,828
1990	12,187	1.58	19,256

however, will sustain soybean expansion, assuming no changes in relative prices: the movement of farmers into the frontier areas of Mato Grosso do Sul, Goias, and the Minas Gerais triangle as highways and storage are expected to improve, and the booming poultry industry which drives the demand for feed grain and soybean meal.

Future poultry production is only limited by domestic demand and the volume that can be absorbed by the export market. The technology is sufficiently flexible to adapt to most any demand. An annual increase in production of 5 percent should assure domestic supply and a substantial growth in exportable supplies (table 13). A key element in Brazil's competitiveness will be the cost of labor and the continuation of policies that subsidize inputs.

Most of the production is expected to continue in the five southern states of Sao Paulo, Parana, Rio de Janeiro, Santa Catarina, and Rio Grande do Sul. The supplies of feedstuffs, corn, and soybean meal, as well as the mixed feed industry, is already centered there. When the country develops toward the Central-West, poultry production could extend in that direction.

Farm Product Demand

The industrialization of Brazil generated high levels of employment, sharp income growth, urbanization, and shifting consumer tastes. Per capita consumption of

Table 13—Poultry production, base period and projections, selected years, 1979-90

Year	Production
	<i>1,000 tons</i>
1979	1,096
1980	1,380
1981	1,491
1983	1,700
1985	1,875
1990	2,150

foods high in carbohydrates and normally associated with low income and rural diets declined as a result.

Consumption Patterns

Strong growth in real incomes and urbanization during the sixties and seventies boosted per capita demand for high-value products, such as meats, dairy products, oilseeds, fruits, and high-protein cereals (table 14). The largest gainers were poultry and wheat. The rapid growth in poultry and, to a lesser extent, pork production, created a demand for feedstuffs which was primarily satisfied by corn and soybean meal. Corn for feed use grew at over 6 percent per year, but the amount of corn consumed by humans declined. Soybean consumption rose because demand for oil and broiler feed increased.

Table 14—Per capita demand for farm products, 1969-71, 1979-81, and projections for 1985 and 1990

Commodity	1969-71 ¹	1979-81 ¹	1985	1990
<i>Kilograms/capita</i>				
Wheat	37.91	54.79	54.17	56.62
Corn	131.11	172.28	170.66	177.07
Rice (milled)	42.59	50.80	50.51	51.65
Other grains ²	3.05	3.74	3.73	4.01
Soybeans ³	4.32	25.19	23.84	29.21
Other oilseeds ³	2.61	2.04	2.04	1.95
Beef	18.25	18.08	17.99	19.65
Poultry	2.19	9.35	9.07	10.19
Pork	6.94	7.87	7.85	8.32
Milk (fresh)	78.22	87.81	87.55	92.86
Eggs	3.35	3.62	3.61	3.88
Apples	1.45	1.89	1.87	2.11
Oranges	24.96	25.63	25.60	26.36
Bananas	40.56	37.96	37.98	37.42
Pulses ⁴	24.98	18.49	18.51	17.97
Potatoes ⁵	39.16	25.60	25.60	25.60
Manioc	312.96	202.23	202.57	193.74
Sugar ⁶	38.96	47.46	47.40	48.81
Coffee	5.53	4.02	4.02	4.02
Tomatoes	7.87	12.35	12.29	13.42
Onions	2.88	5.75	5.72	6.25

¹3-year average

²Barley, oats, rye, and sorghum.

³Soybean meal equivalent.

⁴Mostly black beans.

⁵Irish potatoes and sweetpotatoes.

⁶Human consumption only.

Sources: (3, 14) and authors' estimates.

The basic staples in the Brazilian diet include wheat, rice, corn, black beans, manioc, potatoes, and pork. All but wheat and potatoes are more heavily consumed in rural areas. Urban families eat more beef, poultry, dairy products, vegetables, fruits, and wheat, and other carbohydrates. The primary protein sources in the rural areas are pork, beans, and milk.

Almost all locally produced commodities are destined for direct human consumption save for three significant exceptions. Corn for feed accounts for four-fifths of domestic use, and 40 percent of this amount is used in the mixed feed industry. About two-fifths of sugarcane is allocated to produce ethanol for use in the gasohol program. Roughly one-third of the soybean crop is consumed domestically, both as cooking oil and as animal feed. The remainder of the crop is exported largely as meal. Other important agricultural exports include sugar, poultry (fresh and frozen), frozen orange juice concentrate, fresh bananas, coffee (beans and soluble), cocoa (beans, paste, and powder), lint cotton, and unmanufactured tobacco.

Food Policy

To curb high inflation and to provide low-cost food and raw material to the urban and industrial sectors, the Brazilian Government instituted food subsidies and price controls. By far the most ambitious program subsidized wheat purchases beginning in the early seventies. By the late seventies, the cost of imported wheat was three to four times greater than the controlled price to domestic millers. The price was further controlled at the retail level by fixing the miller-to-retailer margin. The large subsidy increased wheat consumption largely at the expense of substitutes, such as rice, dry beans, corn, and manioc. This subsidy was scheduled for phaseout by January 1983, but the action has been postponed until 1985.

Higher incomes and food subsidies boosted soybean oil consumption from 214,000 tons in 1970 to 1.2 million in 1977, blunting per capita consumption of other oilseeds. Subsidies for soybean production fostered low consumer prices. In addition, low-cost credit stimulated expansion of the oilseed-processing industry. Today excess crushing capacity has generated occasional demand for soybean imports for crushing and re-exporting the products.

The consumption of a variety of other commodities has been affected by some form of selectively used price-stabilizing intervention: among the more common actions are stockpiling, import and export regulations, taxes, low-cost credit, administered price subsidies, ceiling prices, fixed marketing margins, maximum profit ratios, and discounts on food sold by public agencies. Buffer stocks stabilize prices for beef, powdered milk, rice, and dry beans. Fresh milk prices are fixed at the retail level, and distributors are paid a subsidy. The Government has controlled coffee and sugar prices, but the coffee subsidy was removed in July 1981.

Consumers may also have benefited indirectly from programs designed primarily to reduce production and marketing costs. As discussed earlier, heavy use of subsidized producer credit generally kept costs down. In some cases, such as fertilizer, agricultural input prices were controlled. Subsidized credit for private commercial storage construction and onfarm storage was provided. Fruit and vegetable marketing overhead was partially financed by Government funds, and some foods were sold below cost in poorer urban markets. These and other incentives, however, may have been partially offset by high import tariffs established to encourage import substitution.

Demand in the Eighties

The Brazilian economy is expected to recover gradually from the sluggish growth of the early eighties. The rate of growth in real GDP is estimated to be less than half of the average rate achieved during the past decade, about 3.5 percent per year, assuming a gradual economic recovery to the mideighties and leveling off at 5 percent or so until 1990. The austerity programs designed to control inflation and reduce the large foreign debt will temper the economic recovery. Import restrictions and reduced Government expenditures on consumer subsidies will be the primary factors controlling consumption.

Food demand will be dampened by weak income growth, the gradual removal of subsidies and price controls, and purchasing power erosion when wages are not fully adjusted for inflation. Population is projected to grow at an average annual rate of 2.1 percent throughout the remainder of the eighties continuing a moderate downward trend. Slow income and population growth

and more moderate urbanization will tend to stabilize consumption patterns. As a result, no significant shifts in food preferences are expected as occurred during the past three decades of rapid urbanization (table 14). The removal of consumer subsidies and slow economic growth will likely limit per capita consumption and may dampen demand for high-value commodities, especially those that account for a large percentage of disposable income such as meats, dairy products, and high-protein cereals. Offsetting this direction will be the usually higher income elasticities assumed for these food categories which will tend to shift larger shares of increasing income to these commodities.

Income elasticity estimates based on past trends were thought to be high because of the sometimes overriding effects of price controls, consumer subsidies, and other interventions that stimulated additional demand not directly attributable to income growth. Therefore, demand estimates based on calculated income elasticities would tend to be high under the assumption of no changes in relative prices. Thus, the elasticities derived from historical calculations were adjusted for use in the projections to compensate for the effects of such exogenous factors (table 15).

Per capita consumption in 1985 and 1990 was projected by a formula that incorporated a constant income elasticity, population growth, and income growth rates.

Table 15—Income elasticities used to project per capita and total food consumption

Commodity	Elasticity	Commodity	Elasticity
Wheat	0.30	Eggs	0.50
Corn	.25	Apples	.80
Rice (milled)	.15	Oranges	.20
Other grains ¹	.50	Bananas	-.10
Soybeans	1.40	Pulses ²	-.20
Other oilseeds	-.30	Manioc	-.30
Beef	.60	Sugar ³	.20
Poultry	.80	Tomatoes	.60
Pork	.40	Onions	.60
Milk (fresh)	.40		

¹Barley, oats, rye, sorghum.

²Mostly black beans.

³For human consumption only.

Sources: (3, 12, 13) and authors' estimates.

Population and income were projected separately, based on the demographic and economic assumptions discussed earlier in this report.

For the eighties, per capita food demand was estimated to grow much slower than during the seventies (table 14). Moreover most of the growth is expected to occur in the 1985-90 period. USDA analysts project little growth in the consumption of domestic food crops such as manioc, potatoes, fruits, and pulses; some products may decline.

Imports and Import Constraints

Agricultural imports during 1970-81, especially from the United States, trended sharply upward (table 16). Production shortfalls and the current recession have caused wide fluctuations in trade. However, some commodities continued to be imported regularly. Others, such as corn and rice, were imported only occasionally to satisfy temporary shortfalls in domestic production.

Import Trends

Brazil imports more wheat than any other crop, absorbing about half of the total food import bill. The Government has been the sole importer of wheat, which is imported duty free. The volume averaged over 4 million tons in recent years. The Government, which had subsidized wheat consumption during the seventies, reversed its policy in 1980 when the quota to the mills reached 6.6 million tons supported by 4.6 million tons of wheat imports. Consumer subsidy phaseouts forced mill quota cuts to 6.3 million tons in 1981 and 5.9 million tons in 1982. However, 1983 wheat imports are still expected to be close to 4.3 million tons because of a poor wheat harvest.

The United States supplied 77 percent of Brazil's wheat in 1981 (table 17). Brazil's emerging balance-of-payments problems made it urgent to get credit especially at concessional rates. Canada made sharp inroads into that market by providing 3-year agreements with credit. The United States strengthened its position in 1981 by providing some credit guarantees.

Table 16—Major agricultural imports and U.S. share, selected years, 1970-81

Commodity	Unit	1970	1975	1979	1980	1981
Cattle	1,000 head	3.6	12.9	66.5	18.4	11.6
U.S. share	Percent	3.8	1.5	.3	.3	.2
Milk and cream	1,000 tons	22.0	14.2	9.9	61.8	8.5
U.S. share	Percent	8.8	8.9	3.6	4.3	8.1
Eggs	1,000 tons	—	81.0	52.0	53.0	64.0
U.S. share	Percent	—	6.2	71.2	73.6	90.6
Wheat	Million tons	2.0	2.1	3.6	4.8	4.4
U.S. share	Percent	55.1	78.9	41.8	38.0	77.1
Rice	1,000 tons	—	63.2	711.1	238.9	142.5
U.S. share	Percent	—	.1	.3	11.8	0.2
Corn	1,000 tons	2.1	2.1	1,525.9	1,594.0	902.0
U.S. share	Percent	94.3	81.0	100.0	98.8	99.8
Coarse grains	1,000 tons	83.5	65.4	117.2	149.2	—
U.S. share	Percent	2.8	1.8	.3	0	—
Apples	1,000 tons	109.0	143.6	183.1	135.4	112.6
U.S. share	Percent	0	.5	.2	1.0	2.9
Pears	1,000 tons	30.2	30.0	52.1	36.5	35.4
U.S. share	Percent	10.7	17.3	4.5	4.5	10.9
Vegetables, dry	1,000 tons	11.7	15.3	29.9	61.4	19.4
U.S. share	Percent	46.5	44.4	38.6	24.6	34.6
Hops	1,000 tons	1.5	2.0	2.6	2.9	2.6
U.S. share	Percent	75.6	74.0	77.9	75.3	64.3
Oilseeds	1,000 tons	61.2	.7	101.2	23.1	9.9
U.S. share	Percent	0	0	0	.1	0
Soybeans	1,000 tons	1.2	.2	213.5	460.6	931.3
U.S. share	Percent	0	0	21.8	4.2	8.3
Seeds	1,000 tons	1.7	2.1	3.8	3.1	1.1
U.S. share	Percent	28.9	35.6	47.4	71.5	49.1
Inedible tallow	1,000 tons	37.6	37.4	70.5	67.8	36.5
U.S. share	Percent	6.3	89.7	11.3	26.7	0
Total imports	Billion dols.	.3	.9	2.4	2.5	2.2
U.S. share	Percent	23.4	39.6	24.7	30.1	44.6

— = not available.

In November 1982, the United States offered blended credit, which included a mix of guaranteed and interest free loans. Brazil accepted the offer of \$60 million of credit, including \$12 million interest free and \$48 million at commercial rates.

Canada is the major U.S. competitor in Brazil's wheat market. Canada signed a 1982 agreement to provide annual wheat imports of 1 to 1.5 million tons for 3 years on credit terms not made public. Argentina, which had annually provided about 1 million tons during the sixties, turned its attention to developing-country markets in the seventies and became an intermittent supplier to Brazil.

Few expected Brazil to become a corn-importing country; however, 2 years of drought and a strong demand from the growing poultry industry caused what is expected to be a temporary aberration. Imports in 1979 and 1980 exceeded 1.5 million tons (table 18). However, a good harvest halted imports in 1982 after an initial shipment of 587,000 tons. The U.S. market share has been close to 100 percent for most recent years.

Brazil is one of the world's largest rice producers and in general manages to produce enough to meet its own needs. Varying weather triggers fluctuations in output and subsequent changes in trade. A high of 711,135 tons was imported in 1979 (table 19). Yet more than 400,000 tons were exported in 1977. When rice was imported, the principal suppliers were from Asia and Argentina and Uruguay. The largest U.S. share, at 12 percent, was registered in 1980.

A number of minor grains and their products are imported on a more or less regular basis mainly for the food-processing industry. Malt is the most important of these at an average 230,000 tons per year during 1975-79. Barley, used primarily in brewing, averaged over 24,000 tons of imports, supplying from one-third to one-half of demand. France, Belgium, Argentina, and Chile supplied most of these products. The United States has made no sales in recent years. Annual oats imports averaged 28,200 tons during 1975-79. Argentina is the favored supplier; the largest import ever from the United States was 139 tons in 1979.

Brazil is a sporadic market for fats and oils, importing mainly to make up temporary shortfalls in its own production or for special products such as olive oil which

Table 17—Wheat imports and market shares, 1973-81

Year	Imports from the world	U.S. share	Canadian share	Argentine share
	<i>1,000 tons</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1973	2,945	52.4	13.8	33.7
1974	2,399	45.0	52.4	2.6
1975	2,098	78.9	15.9	2.1
1976	3,428	46.6	30.4	21.1
1977	2,624	22.9	34.0	33.6
1978	4,335	68.4	29.4	1.6
1979	3,654	41.8	9.6	40.5
1980	4,755	38.0	39.1	16.7
1981	4,360	77.1	18.6	1.1

Source: (11).

Table 18—Corn imports, 1978-81

Country of origin	1978	1979	1980	1981
	<i>Tons</i>			
Argentina	220,819	0	19,109	40
United States	1,040,762	1,525,930	1,574,878	899,873
Chile	134	0	0	49
Paraguay	415	0	0	2,063
Other	2	0	10	1
Total	1,262,132	1,525,930	1,593,997	902,026

Source: (11).

Table 19—Milled rice imports, 1978-81

Country of origin	1978	1979	1980	1981
	<i>Tons</i>			
Argentina	0	47,925	24,689	0
Burma	0	45,124	60,337	38,073
Pakistan	0	167,437	26,576	0
Philippines	0	23,220	30,221	31,500
Thailand	0	274,742	22,197	72,383
Uruguay	11,198	98,256	24,140	300
United States	554	2,230	28,190	268
Other	16,881	52,201	22,546	0
Total	28,633	711,135	238,896	142,524

Source: (11).

the country does not produce. As mentioned earlier, soybeans are being imported mainly to use an excess crushing capacity of about 5 million tons. The maximum harvest to date has been 15.2 million tons, falling short of the country's crushing capacity of over 20 million tons. Brazil adopted a drawback system whereby importers of soybeans must export an equivalent amount of product. In 1981, for example, total imports were just under 1 million tons (table 20). The major suppliers were Argentina, Paraguay, and the United States, which supplied about 8 percent in that year.

Imports of live cattle averaged 32,600 head per year during 1975-79. Most came from Argentina, Bolivia, Paraguay, and Uruguay and were predominantly for slaughter. A small proportion were breeding cattle from the United States, Canada, and the European Community (EC). Canadian and U.S. shares of the breeding cattle market were roughly equal. Temperate zone cattle bloodlines from the United States have a place in comparable zones of Rio Grande do Sul.

Brazil stocks fresh beef during the slaughter season for release during the dry season between July and September when prices tend to rise. The volume of imports, all from Argentina and Uruguay, averaged 59,088 tons during 1975-79. The other important meat import, edible offal, came from the same sources.

Annual milk and cream imports averaged 29,800 tons during 1976-80, nearly all of it nonfat dry milk. The EC, notably Ireland, the Netherlands, and France were the main suppliers. The United States supplied an average of about 230 tons a year.

Baby chicks, hatching eggs, and sheepskins are among the lesser livestock products which are imported on a fairly regular basis. Most of the baby chicks, just under 300 million per year, come from the United States. Small quantities are shipped from Canada and the Netherlands. Similarly, hatching eggs were imported for the thriving poultry industry. Brazil imports sheepskins mostly from Argentina, Australia, and Chile. The United States tends to have only 10 to 20 percent of that market.

The soap industry imports inedible tallow regularly during the offseason when domestic slaughter is low. During the late seventies, the seasonal deficit averaged about 42,000 tons. Before 1977 the U.S. share of the market exceeded 40 percent, but Argentina became

the dominant supplier in 1978 and continues to hold this position (table 21).

The tallow market is closely controlled. For most of the year, the tariff is 55 percent of the imported value. However, when an offseason quota is authorized, a reduced rate of 5 percent applies. Argentina, because of its membership in the LAIA, is the preferred source and has become the main supplier. Occasionally, quotas are granted to other suppliers. In 1981 the United States exported 18,120 tons to Brazil for 27 percent of the market, the highest level recorded in recent years.

Although Brazil is a major producer of tropical fruits, it is a substantial market for temperate-zone fruit products, especially apples and pears which grow only in Brazil's

Table 20—Soybean imports, 1978-81

Country of origin	1978	1979	1980	1981
<i>Tons</i>				
Argentina	6,000	78,493	272,349	259,597
Paraguay	5,000	86,712	159,629	572,816
United States	78,369	46,509	19,402	77,500
Other	0	1,760	9,215	21,401
Total	89,369	213,474	460,595	931,314

Source: (11).

Table 21—Imports of inedible tallow, selected years, 1970-81

Country of origin	1970	1975	1979	1980	1981
<i>Tons</i>					
Argentina	5,970	510	62,492	49,671	35,836
Paraguay	0	3,365	0	0	0
United States	525	33,571	7,986	18,120	0
Uruguay	1,387	0	0	0	644
West Germany	2	0	50	0	0
Other	5	0	0	0	0
Total	7,889	37,446	70,528	67,791	36,480

Source: (11).

higher elevations. Apple and pear demand, which usually exceeds supply, has been growing steadily. Imports of fresh apples in 1980 were 135,410 tons, and fresh pears, 35,546 tons. Imports were greater in some previous years. Argentina, which is exempt from a 37-percent tariff on apples due to LAIA preferences, dominates the market. The U.S. share of the apple market has generally been less than 1 percent (table 16). The market for U.S. pears has been more favorable in recent years, ranging from 5 to 11 percent. The 37-percent tariff is reduced seasonally for apples and permits each country to export 10,000 tons to Brazil from August through December. Importers must make a new request each year for the quota.

Dried grapes are also imported regularly. During the late seventies, imports averaged 3,720 tons mostly from Argentina, Mexico, and Chile under the LAIA preference. The U.S. volume seldom surpassed 100 tons.

Many other products are imported annually from a wide range of sources and in varying quantities. Most of them are not large in volume but may be significant to U.S. producers. For example, the United States supplies over 70 percent of Brazil's imported hops. Brazil imports 8,000 tons of edible nuts per year, mostly from Spain, Portugal, and the United States. A wide variety of improved seeds for planting are imported to the extent of some 3,000 tons each year nearly duty free. The United States supplied well over 50 percent, and Australia, Uruguay, and Argentina shared the rest of the market.

Dry legumes are imported periodically, although Brazil is the largest producer of dry beans in the world. Occasional droughts trigger deficits which are usually satisfied through imports. Annual imports averaged less than 30,000 tons in most years during 1973-79. The United States has been supplying about a third of the market in recent years (table 22).

Imports in the Eighties

The economic slowdown projected for the eighties will temper the strong import demand of the seventies (tables 23 and 24). More moderate increases are forecast for production and consumption of major agricultural commodities during the eighties. Although

1983 production estimates appear optimistic for some commodities, given current economic conditions and unforeseen weather changes, consumption may be lower than 1983 estimates due to stricter austerity measures than anticipated. There is greater confidence in the longer run projections.

Wheat will continue to dominate the import scene and will dwarf imports of most other products. Brazil will likely add 500,000 tons of wheat through 1990 to its current imports of 4.4 million tons. Surplus soybean production will mean exports about 40 percent higher in 1990 than during the base period average (1979/81). Although soybeans will continue to be the primary agricultural export earner, occasional large imports of beans are expected. Excess capacity will persist following a proposed expansion of some 4 million tons of crushing capacity. Attempts to use this capacity fully will continue as long as beans can be imported at competitive prices and if domestic or foreign markets can be found for meal and oil. Despite the large corn and rice imports of recent years, production should satisfy demand with an exportable corn surplus building over time.

Poultry exports will be hampered by a slowing of world economic growth and increasing export competition. Brazil may expand poultry exports throughout the eighties by 35 percent above the 458,000 tons exported in 1982.

Other foods that appeal to high-income people will be among the commodities affected most by the slower

Table 22—Imports of dry leguminous vegetables, selected years, 1970-81

Country of origin	1970	1979	1980	1981
<i>Tons</i>				
Argentina	3,051	9,844	39,672	7,228
Chile	1,580	6,176	5,989	3,963
Mexico	978	2,217	511	1,309
Paraguay	0	0	60	0
United States	5,433	11,545	15,136	6,711
Other	648	147	79	177
Total	11,690	29,929	61,447	19,388

Source: (11).

Table 23—Production, consumption, and trade of major commodities, selected years, 1969-71, 1979-81, and estimates for 1983, 1985 and 1990

Items	1969-71 average	1979-81 average	1983	1985	1990
<i>1,000 tons</i>					
Wheat:					
Production	1,667	2,591	2,751	2,976	3,620
Consumption ¹	3,627	6,683	7,001	7,361	8,512
Net trade	-1,960	-4,092	-4,250	-4,385	-4,892
<i>Kilograms</i>					
Per capita consumption	38	55	54	54	57
<i>1,000 tons</i>					
Corn:					
Production	13,680	19,699	21,410	24,500	28,260
Consumption ¹	12,545	21,015	22,087	23,191	26,618
Net trade	1,135	-1,316	-677	1,309	1,642
<i>Kilograms</i>					
Per capita consumption	131	172	169	170	177
<i>1,000 tons</i>					
Soybeans:					
Production	1,548	13,531	14,634	15,828	19,256
Consumption ¹	534	3,976	3,868	4,192	5,680
Net trade	1,013	9,555	10,706	11,636	13,576
<i>Kilograms</i>					
Per capita consumption	6	33	30	31	38
<i>1,000 tons</i>					
Rice (milled):					
Production	4,179	5,895	6,210	6,595	7,660
Consumption ¹	4,075	6,197	6,556	6,864	7,764
Net trade	104	-302	-346	-269	-104
<i>Kilograms</i>					
Per capita consumption	43	51	50	51	52
<i>1,000 tons</i>					
Poultry:					
Production	210	1,322	1,700	1,875	2,150
Consumption ¹	210	1,141	1,156	1,232	1,532
Net trade	0	181	544	643	618
<i>Kilograms</i>					
Per capita consumption	2	9	9	9	10

¹Domestic disappearance—food, feed, seed, stocks, and waste.

economic growth. These include most livestock products, fruits and vegetables (fresh apples, dry legumes), and sugar-based products such as soft drinks. Somewhat less affected will be those industrial inputs used directly in the production of consumer goods, such as barley, hops, and malt for alcoholic beverages, hides for shoe and clothing manufacture, and inedible tallow for soap and cosmetics (table 24). Imports of agricultural inputs are expected to suffer the least, especially those items which are used to produce goods for export such as seeds for planting. Hides would also fall into this category because of Brazil's large shoe export industry.

Some commodities are expected to experience wide variations in import levels from year to year. The future import demand for beef, tallow, and hides will likely be affected by changes in the domestic cattle cy-

cle. Apples, pears, legumes, and animal feed imports will vary with the vagaries of weather and markets. All commodities are subject to Government policies that may or may not relate to excess or declining production.

Future imports of some commodities will be affected by recent developments not mirrored in historical trends. For example, a growing market exists for items such as bull semen and cattle embryos which would tend to reduce the need to import breeding cattle. Live cattle imports for slaughter are expected to continue, however, especially during periods of production shortfalls. Per capita beef consumption fell in recent years when poultry demand surged, sharply reducing beef imports since 1979 (counter to what the beef cycle would indicate) and reducing prospects for

Table 24—Imports of minor agricultural commodities, selected years, 1969-71, 1979-81, and estimates for 1983, 1985 and 1990

Commodity	Total imports, 1969-71	U.S. share	Total imports, 1979-81	U.S. share	Estimated imports, 1983	Projected imports, 1985	Projected imports, 1990
	<i>Tons</i>	<i>Percent</i>	<i>Tons</i>	<i>Percent</i>	<i>-----Tons-----</i>		
Food:							
Apples	114,756	0	143,697	1	145,000	145,000	150,000
Beef	2,268	0	78,459	0	80,000	80,000	90,000
Butter	156	—	2,445	0	1,000	1,000	1,000
Dry legumes	12,383	44	36,921	30	40,000	42,500	50,000
Dry milk	16,345	88	26,793	2	25,000	25,000	30,000
Nuts	7,914	11	9,587	6	10,100	10,500	11,600
Pears	29,346	13	41,363	6	37,500	40,000	50,000
Industrial inputs:							
Barley	37,419	0	84,267	0	100,000	110,000	150,000
Hides and skins	1,051	0	2,017	7	2,250	2,500	3,500
Hops	1,492	74	2,655	73	3,000	3,240	4,500
Malt	88,014	0	223,510	0	240,000	260,000	340,000
Sugar and honey	955	3	4,115	19	4,500	5,000	7,000
Tallow	33,357	33	58,266	15	65,000	70,000	90,000
Agricultural inputs:							
Eggs	111	11	56	80	55	50	50
Feedstuffs	11,282	8	10,906	4	11,000	11,000	11,000
Live cattle	4,166	2	32,178	—	35,000	40,000	60,000
Potatoes	12,823	0	20,118	0	15,000	16,250	20,000
Seeds	1,218	27	2,665	57	3,000	3,250	4,500

— = not available.

Sources: (11) and authors' estimates.

significant increases in beef imports. Recent increases in apple and pear plantings will cut into future imports.

Several agricultural commodities have a secondary but increasing role in Brazil's import makeup. But based on the experience of the seventies, the outlook for increasing the U.S. share is less than optimistic, mainly because of the effects of LAIA preferences. These products include pears, apples, fresh grapes, preserved fruit, seeds for planting, sweeteners, and eggs. The United States should be able to maintain current shares of 70 percent for hops, 30 percent for dry edible beans, and 10 to 15 percent for inedible tallow.

Many of Brazil's minor commodity imports have virtually excluded trade with the United States. These include barley, oats, malt, butter, cheese, beef, wool, tobacco, cotton, potatoes, and oilseeds. Except for tobacco and raw cotton, these import markets have been expanding and may open to future U.S. export development.

Market and Policy Constraints

The Government is the major buyer of duty-free grains for direct consumption and duty-free beef purchased for the seasonal stockpile. Private importers, on the other hand, are subject to a variety of licenses, tariffs, quotas, exchange controls, taxes, and inspections. For some commodities, quotas are allowed at reduced duty rates depending on how essential they are in consumption or for production. Agricultural inputs such as seeds, breeding stock, and fertilizers receive favorable treatment and may be exempt from import restrictions.

The Government controls the import of all wheat on a duty-free basis. The quantity is usually determined by the size of the crop and an allowed quota to the mills. Within these limits, the purchases are made by tender. Occasionally this procedure is set aside to satisfy a bilateral agreement such as the one made with Canada. Purchases are made by the *Junta Deliberativa do Trigo* (Wheat Board), a division of the Bank of Brazil. Corn and rice imports are treated similarly, but the responsible agency is different. For corn, the importing agency is the *Comisao de Financiamento da Produca* (CFP); for rice, it is the semigovernmental *Instituto Rio Grandense do Arroz*. Beef imports are handled by COBAL, a public enterprise formed to execute the Government's food

supply plans and to maintain stocks of important staples including beef.

The purchase of agricultural inputs such as seeds, breeding cattle, baby chicks, and fertilizers are made largely by the private sector and are for the most part free from trade restrictions. Some industrial inputs, such as soybeans, are also exempt except for the drawback provision. For most other agricultural inputs, high tariff schedules are maintained, which lie in the range of 15 to over 100 percent. At critical times these may be loosened to allow a specified quota to enter at a lower rate. In addition, port taxes can reach 11 percent, and there is a financial transactions tax of 25 percent on foreign exchange. If these prove ineffective in controlling imports, the Government may resort to licensing, quotas, and other constraining mechanisms. Within the country, agricultural products are allowed to be traded openly, with few exceptions, but are subject to taxes, subsidies, price ceilings, and quality regulations.

U.S. attempts to increase imports to Brazil will likely meet with only modest success over the next few years. A major constraint to developing this market will be the likely continuation of Brazil's austerity program. No matter what demands are registered among consumers or industrial users, the Government will probably feel a need to resist imports of any product which does not contribute substantially to the resumption of economic growth. This posture is likely to persist through 1985.

The public policies of Brazil tend to protect industry and agriculture which have potential for self-sufficiency. The level of protectionism is high for the most part, although some of the tariffs and port taxes could presumably be negotiated downward for some commodities.

To develop the Brazilian market, the United States must cope with foreign competition from LAIA countries, Canada's willingness to offer concessionary credit, and the pricing policies of the EC. A survey of agricultural imports for a typical year, such as 1978, showed a total value of agricultural imports of more than \$1.5 billion. The United States had the largest share at 38 percent; the LAIA group held the next largest share at 35 percent; Canada had 13 percent; and the EC, 7 percent.

LAIA countries have the obvious advantages of geographic closeness, low transport costs, and tariff preferences. Under this agreement, tariffs among member countries are very low and in some cases nonexistent. In 1978 the principal commodities traded were fruit, vegetables, cattle, beef, wool, and soybeans. Most LAIA trade in farm products focused on Argentina which has a production pattern similar to the United States.

The Canadian advantage centers primarily on high-quality wheat which blends well with Mexican wheat. Canada has succeeded for over a decade by assuring supply through 2- and 3-year agreements and offering much desired credit.

The EC's advantage comes largely through export subsidies. Even so, market penetration was limited to a few high-value products, such as barley malt, dry milk, cream, wine, and fresh potatoes. Minor inroads brought in hops, hides, seeds, and breeding cattle.

Conclusions

The United States market development strategy in the next decade must consider Brazil's import constraints; their relaxation will come only with a vastly improved economy. The ground rules that will govern Brazilian trade in the next few years are determined by the country's heavy foreign debt problem. Brazil seems determined to keep nonessential imports to a minimum through an assortment of taxes, tariffs, and nontariff barriers. As new markets develop in the future they could fall to LAIA as that organization becomes more effective in developing trade among its members.

The United States has a near-term advantage: it can provide the credit which Brazil needs desperately at this time. The credit can be especially effective in assuring a continuing large share of the wheat market

against Canadian and other competition. Credit may even be a useful tool for improving access to other commodities, including rice, as long as the debt situation remains critical.

U.S. exporters need to be aware of opportunities which arise when exceptions are made to accommodate special national needs. During the seventies, these opportunities had fallen into four categories which are most likely to represent the opportunities of the eighties:

- *Government Food Imports*—In years of drought or low stocks, imports of corn, rice, and beans are required. Seasonally, apples, pears, and other minor items are also in demand.
- *Agricultural Inputs*—Minimum restrictions or no duty apply generally to breeding cattle, breeding horses, baby chicks, hatching eggs, seeds, and seed potatoes. These are likely to continue in demand to fuel agricultural development.
- *Industrial Inputs*—Brazil authorizes these to use and develop the capacity of industry. Two primary examples are soybeans imported duty free under a drawback system and occasional inedible tallow imports under quota.
- *Minor Agricultural Imports*—Generally temperate zone fruits. Sometimes these are authorized on a seasonal basis at reduced duty rates. The best examples are apples and pears for which importers have been granted quotas in certain years.

Except for the few products in which U.S. traders already have a substantial share of the market, it will be difficult for the United States to make serious inroads over the next 10 years. However, this does not preclude the possibility of directing market development activities and trade negotiations toward specific commodities.

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